Amendments to the Specification

Please amend the first complete paragraph under the section entitled "Background of the Invention" (see line 10 on page through line 1 on page 2 in the original English-language translation of the specification) as indicated below:

In the traditional mobile phone roaming procedure, communication links have to be established between the mobile networks both in the home region and in the roaming region to support calls of mobile subscribers in roaming state and to enable mobile subscribers in roaming state to use diverse telecom services, such as initiating calls or answering calls. etc. However, since communication route is long and more network resources are consumed in roaming state, the service cost in roaming state is higher than that in normal state. Especially, in international roaming state, any call to the subscriber is international long-distance call, i.e., the call has to be accomplished through the ~~communication links~~voice path between the mobile network in the home country and that in the roaming country; therefore, the roaming subscriber has to pay the international long-distance cost from the home country to the roaming country; even though the caller is within a stone's throw to the roaming subscriber (e.g., when two members in a tourist party are calling in a roam region), both parties have to pay the toll for international call. As a result, the communication demand of roaming subscribers is suppressed by the expensive cost. Therefore, people are eager to implement localized roaming of mobile phones to decrease expensive roaming call cost.

Please insert the following new paragraphs on page 2, line 24 of the original English-language translation of the specification:

The reason for above case lies in the process to called number by the switching device. An international call is first routed to a gateway office in the called subscriber's home country, herein a further determination for the called number's property; if it is a mobile phone number, the call is routed to GMSC in the mobile network for subsequent process. Each country has its independent numbering scheme, so switching devices in one country cannot determine number properties of other countries, i.e., the called is a telephone or mobile phone, because this requires a large quantity of configuration data, and it is more importantly that change of numbering scheme in each country will affect other countries, and this will cause numbering schemes in countries lack of independence.

For solving said problem, the mobile subscriber can use a local number in roaming region/network. Viewed from the point of the roaming region/network, some local mobile phone numbers are allocated for foreign subscribers roaming in the region/network. And the roaming subscriber can share local services using the local number.

Please amend the second complete paragraph on page 3 (see lines 9-15) of the original English-language translation of the specification as indicated below:

Said Roaming Number Manager, connected with the HLR, is used to manage mobile phone numbers in ~~the home region and~~ the contracted roaming regions; said RNM takes the collection of obtained mobile phone numbers in the contracted roaming region as a resource pool, and allocates the mobile phone numbers in the contracted roaming region to roaming subscribers dynamically.

Please amend the paragraph bridging pages 3 and 4 of the original English-language translation of the specification (see lines 18 on page 3 through line 6 on page 4) as indicated below:

The method for implementing localized roaming of mobile subscribers based on said network comprises:

a. configuring the RNM with ~~a~~ local mobile phone numbers in a contracted roaming region/network, an independent PSTN/ISDN (Public Switched Telephone Network/Integrated Service Digital Network) number and a signaling point code;

b. configuring data in the entities of the contracted roaming region/network and that of the home network, so that the subscriber location inquiry message taking the local number in the subscriber's roaming region/network as the destination address will direct to RNM in the subscriber's home network;

c. establishing interfaces between the RNM and entities of the contracted roaming region/network as well as between the RNM and entities of the home network;

d. the subscriber utilizing the configuration in respective entities of the contracted roaming region/network and the home network to develop communication services in the roaming

region/network, implementing localized roaming of the subscriber.

Please amend the second complete paragraph on page 4 of the original English-language translation of the specification (see lines 10-27) as indicated below:

Said step d comprises a subscriber location update process:

d1. the Visiting Location Register VLR at which the subscriber is registered currently sends a location update request to the HLR in the subscriber's home region;

d2. according to the location update request received from the VLR and the current location of the subscriber, the HLR in the subscriber's home region addressing the RNM corresponding to the current subscriber location through the RNM's PSTN/ISDN number and informing RNM of the subscriber location update;

d3. the RNM allocating a mobile phone number, i.e., a <u>local mobile phone</u> number in the roaming region/network, to the subscriber, and returning said number ~~in the roaming region/network~~ to HLR in the home region;

d4. the HLR in the subscriber's home region inserting said <u>local mobile phone</u> number in the roaming region/network in the VLR at which the subscriber is registered currently, and returning an acknowledgement message of obtaining said <u>local mobile phone</u> number in the roaming region/network to RNM.

Please amend the second complete paragraph on page 5 of the original English-language translation of the specification (see lines 9-24) as indicated below:

In detail, the call processing is: when serving as the caller, the subscriber's mobile phone uses the number fed back from the RNM in the subscriber's home region to initiate a call; when the subscriber's mobile phone serves as the called, <u>if the called number is the mobile phone number in subscriber's home region, MSC in the subscriber's home region inquires HLR in the subscriber's home region for the calling route, HLR finds the corresponding subscriber record, obtains address of VLR where the subscriber is roaming, and accesses said VLR to obtain routing information, with which HLR instructs MSC in the subscriber's home region to establish a calling route; if the called number is a local mobile phone number in a roaming region, MSC in the subscriber's roaming region inquires RNM for the calling route, RNM first finds the subscriber's identifier in its home region, then inquires HLR for route, and finally forwards the routing information returned form HLR to MSC in the subscriber's roaming region.</u> ~~the Mobile Switching Center (MSC) in the subscriber's roaming region or the MSC in the subscriber's home region inquires for the call route in Home Location Register (HLR) in the subscriber's home region; the Home Location Register (HLR) in the subscriber's home region inquires for the subscriber corresponding to the called number in the Roaming Number Manager (RNM) in the subscriber's home region, to find corresponding subscriber record, and to obtain the address of Visiting Location Register (VLR) corresponding to the subscriber's roaming, and then accesses said VLR to obtain routing information to instruct the Mobile Switching Center (MSC) in the subscriber's roaming region to establish the call.~~

Please amend the second complete paragraph on page 6 of the original English-language translation of the specification (see lines 6-11) as indicated below:

The information carried in the location update request sent from VLR to HLR in step d1 and ~~the parameters carried in~~ the location update informed from HLR to RNM in step d2 comprise: the subscriber's IMSI and/or the mobile phone number in the home region, the subscriber's current location information and the subscriber's old location.

Please amend the first complete paragraph on page 7 of the original English-language translation of the specification (see lines 2-13) as indicated below:

In the method according to the present invention, since reasonable addressing for RNM as well as respective communication processing, the HLR can obtain services from different RNMs according to the subscriber's roaming region, and a single RNM can provide services for a plurality of HLRs; thereby the flexibility of network structure is enhanced, and utilization rate of numbers in the roaming region is improved; the interfacing between mobile communication network devices is simplified; the impact of implementation of localized roaming to traditional ~~devices in~~ mobile communication networks is reduced, i.e., RNMs should be introduced into traditional mobile networks to implement localized roaming with minimum impact.

Please amend the Brief Description of the Drawings bridging pages

7 and 8 of the original English-language translation of the specification (see line 16 on page 7 through line 16 on page 8) as indicated below:

Fig. 1 is the structural diagram of an traditional cellular mobile communication network;

Fig. 2 is the structural diagram of the cellular mobile phone network according to the first embodiment of the network of the present invention;

Fig. 3 is the structural diagram of the cellular mobile phone network according to the second embodiment of the network of the present invention;

Fig. 4 is ~~an organizational chart of~~a suggested ~~the~~ data structure employed in the network of the ~~embodiment of Fig. 3~~present invention;

~~Fig. 5 is the structural diagram of the cellular mobile phone network according to the third embodiment of the network of the present invention;~~

Fig. [[6]] 5 is the structural diagram of the cellular mobile phone network according to the third embodiment of the network of the present invention~~the structural diagram of a cellular mobile phone network implemented with the method according to the present invention;~~

Fig. [[7]] 6 is the flow diagram of the first embodiment implemented with the method according to the present invention;

Fig. [[8]] 7 is the roaming subscriber location update signaling flow used in the present invention;

Fig. [[9]] 8 is a signaling flow used in the present

invention, through which the roaming subscriber is called by means of his/her[[a]] number in the roaming region;

Fig. [[10]] 9 is a signaling flow used in the present invention, through which a short message is sent to the subscriber by means of his/her[[a]] number in the roaming region;

Fig. [[11]] 10 is a signaling flow used in the present invention, through which the roaming subscriber is called by means of his/her[[a]] mobile phone number in the home region;

Fig. [[12]] 11 is the flow diagram of the second embodiment of the method of the present invention.

Please amend the paragraph bridging pages 8 and 9 of the original English-language translation of the specification (see line 27 on page 8 through line 12 on page 9) as indicated below:

In the implementation of localized roaming of mobile phones according to the network provided by the present invention, ~~the home network where the subscriber's mobile phone is allocates a local mobile phone number in the roaming region to the mobile phone subscriber automatically according to the roaming region where the subscriber's mobile phone is roaming and if the roaming region is a contracted roaming region, and inform the subscriber of the number.~~ a mobile phone(subscriber) when roaming is automatically allocated a local mobile phone number in the roaming region by its home network if the roaming region is a contracted roaming region(which has reached some agreement with the home operator). When the subscriber leaves the contracted roaming region, the home network releases the temporary number used by the

subscriber. In a contracted roaming region, the subscriber uses the local number to initiate calls or answer calls and enjoy localized roaming service. For example, when the subscriber is roaming in a roaming country, the subscriber needn't to pay the charge for international long distance calls when he/she answers calls; thus the communication cost in roaming state is reduced greatly.

Please amend the last paragraph on page 9 of the original English-language translation of the specification (see lines 24-30) as indicated below:

Said RNM6 is a network entity, which is used to manage mobile phone numbers in the ~~home country and~~ contracted roaming country; said RNM takes the collection of obtained mobile phone numbers in the contracted roaming country as a resource pool, and allocates the mobile phone numbers in the contracted roaming country to roaming subscribers dynamically; furthermore, RNM is also used to:

Please amend the first paragraph on page 10 of the original English-language translation of the specification (see lines 1-3) as indicated below:

(1) Store mobile phone numbers in the ~~home country and the~~ contracted roaming country ~~as well as the mapping between said numbers and subscribers~~;

Please amend the last complete paragraph on page 11 of the original English-language translation of the specification (see

lines 13-30) as indicated below:

If the network shown in Fig.2 is used, the operator delivering localized roaming service requires obtaining mobile phone numbers in some roaming countries for the roaming service; those countries are called contracted roaming countries, and the amount of the required phone numbers in a contracted roaming country relates to the number of subscribers roaming in that country. The more the roaming subscribers are, ~~the more the required phone numbers are, and thus the more the required RNMs are. Therefore, the number of RNMs required in the network according to the present invention should be configured as required, such as 2, 3, etc. To facilitate describing the network according to the present invention, hereunder the present invention is described with a network that has only one RNM as an example~~. As shown in Fig.2, in the home country, the subscriber uses number N; in the contracted roaming country A, he/she uses a local mobile phone number N1; in the non-contracted roaming country B, he/she still use the mobile phone number N in the home country.

Please amend the first complete paragraph on page 12 of the original English-language translation of the specification (see lines 1-14) as indicated below:

In the cellular mobile communication network in the embodiment shown in Fig.2, Base Transceiver Station BTS 1 is a device that transmits or receives radio signals and serves a certain area and establishes radio connections with mobile phone in the area; BTS1 is connected to Base Station Controller BSC2, which manages radio

resource and controls the operation of BTS1; Mobile Switching Center MSC3 is mainly designed to control mobile call process; Visiting Location Register VLR4 is designed to store the data of mobile phone subscribers that are roaming in the region dominated by it. All of above devices are standard ones in a mobile communication network. ~~Roaming Number Manager RNM6 is only visible to Home Location Register HLR5 but invisible to other network entities.~~ HLR, VLR, MSC, and RNM cooperate with each other to manage mobile subscribers.

Please amend the paragraph bridging pages 12 and 13 of the original English-language translation of the specification (see lines 19 on page 12 through line 29 on page 13) as indicated below:

In the network shown in Fig.2, first, the home country where the mobile phone obtains some mobile phone numbers in the contracted roaming country; when a mobile phone is roaming into the contracted roaming country, it registers its location at the local VLR through BTS, BSC and MSC; VLR initiates a location update request to the subscriber's HLR. HLR determines the location change of the subscriber's mobile phon~~e, i.e., HLR determines whether the country where the subscriber's mobile phone is after the location change changed~~; HLR informs RNM that the subscriber's location has changed and requests to allocate a mobile phone number in the roaming country to the subscriber's mobile phone. The RNM ~~in the home country~~ determines if the subscriber is in a contracted roaming country; if the subscriber

is in a contracted roaming country and is the first entry (no local number has been allocated to the subscriber) into the country, RNM allocates a number from the available mobile phone numbers in the contracted roaming country and feeds the number back to HLR, and stores the mapping between the number and the subscriber (the mapping may involve multiple numbers, such as the number in the home country, the temporary local number in the roaming region, and bound numbers); if not, RNM feeds the number in the subscriber's home country back to HLR. The above number fed back by RNM to HLR is called the current default number of the subscriber.   HLR inserts the current default number of the subscriber fed back by the RNM in the home country and other data in the VLR of the current region where the subscriber is, deletes the subscriber record in the original VLR, updates the mobile phone location information in the subscriber record, and informs the subscriber of the current default phone number; if the current default phone number doesn't change, the notification procedure may be omitted. In Fig.2, when the subscriber roams from the home country into the contracted roaming country A, the HLR in the home country allocates a local mobile phone number N1 in the roaming country to the subscriber, and inserts number N1 and other data of the subscriber in the VLR in country A where the subscriber is currently, deletes the subscriber record in the VLR in home country, and informs the subscriber of the current default phone number N1; if the subscriber roams into the non-contracted roaming country B, RNM instructs to use the mobile phone number N[[1]] in the home country; the HLR in the home country inserts number N and other data of the subscriber (e.g., contract data) in the VLR in

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country B the subscriber is.

Please amend the paragraph bridging pages 13 and 14 of the original English-language translation of the specification (see line 30 on page 13 through line 29 on page 14) as indicated below:

When the subscriber answers an incoming call or initiates an outgoing call in the contracted roaming country, the subscriber's mobile phone uses the mobile phone number in the current roaming country to process the call. That is to say, when the mobile phone of the roaming subscriber serves as a caller, it uses the temporary roaming number allocated by RNM (i.e., the current default mobile phone number of the subscriber) to initiate the call; when it is a called, the caller may dial the local mobile phone number in the roaming country or the mobile phone number in the home country, and the MSC in the roaming country (if the caller dials the number in the roaming country) <u>inquires RNM for the calling route</u> or the MSC in the home country (if the caller dials the number in the home country) inquires the HLR in the home country ~~where the called subscriber is~~ for the calling route; <u>in the former case, RNM finds the subscriber identifier according to the called number in roaming country, and then inquires HLR for the route</u>. The HLR ~~in the home country inquires for the subscriber corresponding to the called number in the RNM in the home country (here the called number is a complete phone number comprising country code and local phone number) to~~ find<u>s</u> the corresponding subscriber record and obtain<u>s</u> subscriber location information (i.e., ~~the address of the~~ VLR <u>number</u> in the current roaming

country), and thus obtains the routing information through accessing the VLR in the roaming country, and then instructs the MSC ~~in the roaming country~~ to establish the call. In the RNM in the home country, if any number maps to a subscriber, the mapping is unique; however, a subscriber may correspond to numbers in different countries; no matter which number is dialed by the caller, HLR can find the unique subscriber record and thus obtain the ~~routing~~ subscriber location information. In Fig.2, when the subscriber roams into country A, the calling subscriber who calls the roaming subscriber may dial either number N or N1.

Please amend the first complete paragraph on page 16 of the original English-language translation of the specification (see lines 17-25) as indicated below:

When the caller dials a bound number of the called subscriber, ~~the HLR in the home country of the called subscriber~~RNM will find~~ascertain~~ the subscriber corresponding to the number through inquiry, find the subscribers record, and obtain the subscriber's location information (~~address of~~ VLR number) via HLR, to accomplish route inquiry. Therefore, if the called subscriber has a bound number, the caller will have more choices: the called subscriber's number in the home country, the bound numbers, or the number in the current contracted roaming country.

Please amend the paragraph bridging pages 16 and 17 of the original English-language translation of the specification (see line 26 on page 16 through line 8 on page 17) as indicated below:

Fig.3 shows a preferred embodiment 2 according to the present invention, wherein RNM is integrated into HLR as a module. In the embodiment 2, HLR is enhanced in functionality: it not only stores subscriber data (including subscriber identification number, current default mobile phone number, type of contracted service, current location (~~address of~~ VLR number, MSC number), etc.) but also delivers the following functions: managing mobile phone numbers ~~in the home country and the~~ obtained from the contracted roaming countries, allocating temporary mobile phone numbers in the roaming countries to roaming subscribers, and storing mapping between subscribers and numbers, and release the temporary numbers used by the subscribers when subscribers leave<u>s and enters into the</u> contracted roaming countries.

Please amend the paragraph bridging pages 17 and 18 of the original English-language translation of the specification (see line 9 on page 17 through line 12 on page 18) as indicated below:

Fig. 4 is a ~~organizational chart of the~~<u>suggested</u> data structure employed in the network ~~in the embodiment described in Fig.3.~~ <u>of the present invention.</u>
~~The organizational structure of HLR comprises 3 types of tables: index table of countries, table of local mobile phone numbers, and table of subscriber records. The index table of countries lists home country, contracted roaming countries, and address of table of local mobile phones corresponding to these countries; it can be used to locate the tables of local mobile~~

~~phone numbers in the home country or the contracted roaming~~
~~countries. Countries not included in it are non-contracted roaming~~
~~countries; the table of local mobile phone numbers can be used to~~
~~inquire for the subscriber corresponding to a called number and~~
~~then inquire for the table of subscriber records, and thus find~~
~~record items of the subscriber. The process through which the~~
~~current VLR address of the subscriber is searched for according to~~
~~the called subscriber number is shown clearly in Fig.4.~~

The data structure shown in Fig. 4 comprises three tables
including a country index table, a local mobile phone number table
and a subscriber record table. Herein, the country index table
lists home countries, contracted roaming countries and entry
addresses of the local mobile phone number table corresponding to
these countries, through which the local mobile number table of
the contracted roaming countries and the home countries can be
found, countries not listed in the table are non-contracted
roaming countries; the local mobile phone number table stores the
mobile phone numbers allocated by the contracted country and their
status in a country; the subscriber record table stores subscriber
data, e.g., subscriber location information, subscriber
subscription information. In conventional network, the subscriber
record table can be found in HLR.

In conventional network, a subscriber have only the mobile
phone number in the home country, HLR obtains subscriber location
information through looking up the subscriber record table
according to the mobile phone number in the home country;
according to the present invention, a subscriber may have more
than one mobile phone numbers in different regions/networks: a

number in the currently roaming region, a number in the home country and bound numbers in contracted roaming countries if any. The subscriber location information can be found according to any one of above numbers, and thus routing information is obtained. The procedure in which subscriber location information is inquired according to the subscriber's number in roaming region or the bounds number in contracted roaming country is shown in Fig.4.

A subscriber which has a number NH in the home country is roaming in contracted roaming country A, and the subscriber is allocated for a local mobile phone number NA2.

1.inquiring for the country code contained in called number in country index table, and obtaining the entry address of local phone number table of the corresponding roaming country;

2.obtaining the subscriber identifier through inquiring for NA2 in the local mobile phone number table in contracted roaming country A;

3.inquiring for the subscriber identifier in the local phone number table of home country, and obtaining the subscriber's mobile phone number in its home country;

4.inquiring for the subscriber identifier in subscriber record table, finding subscriber record corresponding to the subscriber, and obtaining the location information;

said steps 1-3 are implemented in RNM, and step 4 is implemented in HLR.

If RNM is integrated in HLR, step 3 can be omitted after step 2, and subscriber location information is obtained through directly inquiring for subscriber identifier in the subscriber record table. This is shown in fig. 4.

~~Fig.5 shows a preferred embodiment 3 in the present invention.~~
~~Only the network in the home country is shown in Fig.5. The~~
~~network comprises a plurality of sub-networks, each of which has a~~
~~HLR; the RNM is connected with a plurality of HLRs and is shared~~
~~by them. In this embodiment, besides above fundamental functions,~~
~~RNM shall also deliver the following functions: first, to~~
~~distinguish different HLRs, RNM needs to store the mapping between~~
~~subscribers and HLRs. Second, since the HLR directed to by the~~
~~mobile phone numbers in the contracted roaming country is~~
~~exclusive, in the route inquiry process, subscriber data may not~~
~~be found in the HLR inquired by MSC; in this case, RNM shall, in~~
~~accordance with the mapping between the subscriber and the HLR,~~
~~inquire for routing information in the contracted HLR of the~~
~~subscriber, and return the inquired HLR to MSC to instruct MSC to~~
~~establish the call route. In this example, the numbers in the~~
~~contracted roaming country can be shared among subscribers of~~
~~different HLRs, to improve utilization rate of the roaming numbers~~
~~in the contracted country.~~

Please delete the first complete paragraph on page 18 of the
original English-language translation of the specification (see
lines 13-25) as indicated below:

~~Taking two roaming countries as an example, above embodiment~~
~~is described; actually, roaming service in a plurality of roaming~~
~~countries can be provided, and the number of roaming countries is~~
~~only limited by the number of contracted countries by operators as~~
~~well as storage capacity and processing capacity of HLRs.   The~~

~~method for localized roaming of mobile subscribers according to the present invention refers to that a subscriber (i.e., a mobile phone) in roaming state obtains a local number in the roaming region and initiates calls or answers calls using the number. Localized roaming service can reduce communication costs of mobile phone subscribers in roaming state greatly and meet roaming subscribers' communication demand well.~~

Please amend the second and third complete paragraphs on page 19 of the original English-language translation of the specification (see lines 14-26) as indicated below:

~~Taking roaming across countries as an example, the application environment of the present invention will be described, as shown in Fig.6~~<u>Fig.5 is the third embodiment of the present invention</u>. Fig. [[6]]<u>5</u> shows the connections between network structures and <u>entities</u>~~devices~~ related with the present invention. There are 3 networks in the figure: a network in the subscriber's home country, a network in the contracted roaming country A and a network in the contracted roaming country B; wherein the cellular mobile network in the home country comprises two HLRs HLR(a) and HLR(b) and two RNMs RNM(a) and RNM(b) RNM(a) and RNM(b) manage local mobile phone numbers provided from the networks in contracted roaming country A and B, respectively.

It should be noted that the <u>entities</u>~~devices~~ in the figure are not all ~~devices~~<u>entities</u> of the network.

Please delete the paragraph bridging pages 19 and 20 of the original English-language translation of the specification (see line 27 on page 19 through line 16 on page 20) as indicated below:

~~In Fig.6, BTS is a device that receives or transmits radio signals and serves for a certain region, and is connected to the subscribers in the region through radio connections; BTS is connected to BSC, which manages radio resource and controls the operation of BTS; MSC is mainly used to control mobile call process; VLR is used to store the data of mobile phone subscribers who roam into its dominated region; Service GPRS Supporting Node SGSN controls establishment and release of packet service. HLR is used to store the subscribers' data including subscriber identification number, mobile phone numbers in the subscribers' home region, current default mobile phone numbers of the subscribers, types of contracted services, and current locations (addresses of VLRs), etc. RNM is used to manage mobile phone numbers obtained from the contracted roaming country, allocates temporary mobile phone numbers in the roaming regions to subscribers, and stores the mapping between subscribers and numbers, and releases the temporary numbers when subscribers leave contracted roaming countries. HLR, VLR, MSC and RNM cooperate with each other to manage mobile subscribers.~~

Please amend the first complete paragraph on page 20 of the original English-language translation of the specification (see lines 17-22) as indicated below:

It is seen from Fig. [[6]] 5 that the structure of the

cellular mobile communication network that implements localized
roaming service is very flexible; there may be a plurality of RNMs
and HLRs in the network; a RNM can provide service for a plurality
of HLRs, so contracted numbers can be shared by subscribers of
these HLRs and usage efficiency of contracted number is improved;
a HLR can obtain service from different RNMs, depending on the
subscriber's roaming region, in such an arrangement, numbers from
a contracted roaming country are managed in a concentrated
manner(the same RNM) and addressing is simplified.

Please amend the paragraph bridging pages 20 and 21 of the
original English-language translation of the specification (see
line 23 on page 20 through line 16 on page 21) as indicated below:

Taking the Global System for Mobile Communications (GSM) as an
example, the method for implementing localized roaming for
subscribers in mobile communication system according to the
present invention, referring to Fig.[[7]]6, the method comprises:
    Step 1: allocating independent PSTN/ISDN number and
independent signaling point code, so that RNM can be addressed in
the telephone signaling network;
    Said step doesn't change the addressing for traditional
entities in the cellular mobile communication network;
    Step 2: configuring appropriate data in the contracted roaming
region/network and the home network, so that the subscriber
location inquiry message taking the local number in the
subscriber's roaming region/network as the destination address
will be directed to RNM in the subscriber's home network;

For any call to a contracted number, RNM in the logical home region/network of the contracted number will be inquired inquiry for location of the called mobile phone subscriber ~~in the RNM in the logical home region/network of the contracted number~~, taking the contracted number as the destination address~~, should be needed~~. A signaling path from the routing inquiry initiating ~~device~~entity to the RNM is configured, and routing data at the network nodes in the signaling path is configured, so that the signaling message taking the contracted number as the destination address is routed correctly to RNM through the nodes in both the roaming region/network and the home network.

Please amend the first complete paragraph on page 21 of the original English-language translation of the specification (see lines 17-23) as indicated below:

Usually, subscriber location inquiries are often initiated from a GMSC in the physical home ~~cellular mobile communication~~ network of the called number. If the caller is a subscriber in a PSTN, and the network capability is available, the inquiry may be initiated from any signaling point that supports Mobile Application Part (MAP), e.g., local exchanger, international tandem exchange center for outgoing calls, etc.

Please amend the first paragraph on page 23 of the original English-language translation of the specification (see lines 4-10) as indicated below:

Second, it ensures security of subscriber data in the home network: since the GMSC in the roaming region can't access the HLRs in the home region directly but has to access the HLRs through the RNM in the home region and can only obtain the data of a part of subscribers in the HLR(subscribers who subscribes to localized roaming service), RNM can protect HLRs against unauthorized intrusion;

Please amend the second paragraph on page 23 of the original English-language translation of the specification (see lines 11-22) as indicated below:

Third, the RNM is addressed through route inquiry according to the numbers in the roaming region; thus this method avoids addressing to different HLRs ~~for numbers in different roaming regions~~ and simplifies the modification of data configuration in the network. Since the subscribers in the network are distributed in different HLRs, if the contracted roaming phone numbers are allocated to the respective HLRs, the volume of signaling route configuration data described in step 2 will be increased drastically as signaling paths grow, especially when the signaling paths involve a plurality of signaling devices in the contracted roaming region/network and the home network, causing severe degradation of operability;

Please amend the paragraph bridging pages 23 and 24 of the original English-language translation of the specification (see line 23 on page 23 through line 5 on page 24) as indicated below:

Fourth, since some number in a roaming region is managed in a concentrated manner in RNM and shared by different subscribers in HLR, the utilization rate of the numbers is improved, the quantity of required numbers in the roaming region is decreased, and thus the interfaces between HLR and RNM are simplified. Since the subscribers in the network are distributed in different HLRs, if the contracted roaming numbers are allocated to the HLRs, the utilization rate of the numbers will be degraded, and more contracted roaming phone numbers are required; or, though the method of sharing contracted roaming phone numbers among the HLRs may be used, that method will increase interfacing complexity, and the inquiry message may have to be transferred between different HLRs and RNM.

Please amend the second paragraph on page 24 of the original English-language translation of the specification (see lines 12-19) as indicated below:

The embodiment of subscriber location update process is shown in Fig. [[8]]7; wherein RNM (N) is the RNM corresponding to the current subscriber location/network; whereas RNM (O) is the RNM corresponding to the old subscriber location/network (before location update). During the location update process, HLR informs the old VLR to delete the data of the subscriber; as a well-known flow, it is not shown in the Figure; the procedures include:

Please amend the paragraphs bridging pages 25 and 26 of the original English-language translation of the specification (see line 30 on page 25 through line 10 on page 26) as indicated below:

7) ~~If the phone number at the present location and the phone number at the old location are managed by different RNMs, i.e., RNM (O) is different from RNM (N):~~

~~7.1)~~ According to the old location, HLR informs RNM (O) utilizing a "Cancel Location" message to indicate the subscriber has left ~~and requests to delete the subscriber data~~; the parameters of the message include: subscriber identifier and "Old Location". <u>If there is no binding relation between the local number occupied by the subscriber and the subscriber, RNM (O) releases the number</u>;

~~7.2)~~ RNM (O) returns a "Cancel Location ack" message <u>as a response</u> to HLR ~~to acknowledge deletion of data~~; the parameter of the message is the subscriber's identifier;

Please amend the last paragraph on page 26 of the original English-language translation of the specification (see lines 28-30) as indicated below:

2. The signaling flow of calling the subscriber with the subscriber number N' in the roaming region/network (as shown in Fig.[[9]]<u>8</u>):

Please amend the seventh paragraph on page 27 of the original English-language translation of the specification (see lines 21-23) as indicated below:

3. The signaling flow of sending short messages to the subscriber's number N' in the roaming region/network (as shown in

Fig. [[10]] 9).

Please amend the fifth paragraph on page 28 of the original English-language translation of the specification (see lines 17-24) as indicated below:

5) SMS GMSC sends the short message to the MSC or SGSN.

The present invention doesn't require any change to traditional service features in the mobile communication networks; neither does it affect the traditional flows in the mobile communication networks. Taking the signaling flow of calling the subscriber with the number N in the home country H as an example, this advantage will be described, referring to Fig. [[11]] 10.

Please amend the fourth and fifth paragraphs on page 29 of the original English-language translation of the specification (see lines 11-25) as indicated below:

Fig. [[12]]11 is the flow diagram of the second embodiment implemented with the method of the present invention. In this embodiment, taking subscriber roaming in a contracted roaming country and a non-contracted roaming country as an example, the present invention is further described. For convenience, it is supposed that only one RNM is used in the networks of each country.

As shown in Fig. [[12]]11, with the method described in the present invention, the roaming service operator needs to obtain some local mobile phone numbers in other country for the international roaming service; these countries are called

contracted roaming countries, the amount of the required phone
numbers in a contracted roaming country depends on the number of
subscribers roaming in that country; the more the roaming
subscribers are, the more the numbers are required.

Please amend the paragraph bridging pages 30 and 31 of the
original English-language translation of the specification (see
line 5 on page 30 through line 18 on page 31) as indicated below:

When the present invention is implemented in a network shown
in Fig.2 according to Fig.[[12]]11, the home country obtains the
mobile phone numbers in the contracted roaming country first; when
a mobile phone is roaming, in step A1, the mobile phone registers
its location in the VLR in the roaming region through BTS, BSC and
MSC because of change of mobile phone location; the VLR initiates
a location update request to the HLR in the subscriber's home
region. ~~In step A2, HLR determines location change of the
subscriber's mobile phone according to above request, i.e., if HLR
detects the country has changed after location update of the
mobile phone, it~~ HLR informs RNM of the subscriber location update
and requests to allocate a mobile phone number in the roaming
country to the mobile phone. In step A3, the RNM in the home
country determines whether the roaming country is a contracted
roaming country; if the subscriber is in a contracted roaming
country, in step A4, RNM allocates a number from the available
numbers in the contracted roaming country and feeds it back to
HLR, and stores the mapping between the subscriber and the number
(a plurality of numbers may corresponds to the subscriber: the

number in the home country, a temporary local number in the roaming region or bound numbers <u>in other contracted countries</u>); if the subscriber is not in a contracted roaming country, in step A5, NUM feeds the number in the home country back to HLR. The number fed back by RNM to HLR is called the current default number of the subscriber. In step A6, HLR takes the number fed back by the RNM in the home country as the current default number of the subscriber and inserts it along with other data in the VLR in the region where the subscriber stays currently, deletes the subscriber's record in the old VLR, and updates mobile phone location information in the subscriber record; if the subscriber's current default number changes, HLR will inform the subscriber of the new current default number fed back from the RNM in the subscriber's home region. In Fig.2, when the subscriber roams from the home country to the contracted roaming country A, the RNM in the home country allocates a local mobile phone number N1 to the subscriber; the HLR in the home country inserts number N1 and other subscriber data in the VLR in country A where the subscriber stays currently, deletes the subscriber record in the VLR in the home country; when the subscriber roams into a non-contracted roaming country B, RNM instructs the subscriber's current default number is the number N in the home country; the HLR in the home country inserts the number N and other subscriber data (e.g., contracted data) into the VLR in country B where the subscriber stays currently.

Please amend the paragraph bridging pages 31 and 32 of the original English-language translation of the specification (see

line 19 on page 31 through line 16 on page 32) as indicated below:

On the basis of above steps, in step A7, when the subscriber receives an incoming call or initiates an outgoing call, the RNM will process the call. That is to say, if the mobile phone of the roaming subscriber is the caller, it uses the temporary roaming number allocated by RNM (i.e., the current default mobile phone number) to initiate the call; if it is the called, the caller may dial its local mobile phone number in the roaming country or its mobile phone number in the home country, and the MSC in the roaming country (if the caller dials the number in the roaming country) inquires RNM or the MSC in the home country (if the caller dials the number in the home country) inquires HLR for the calling route to ~~in the HLR in the home country of~~ the called subscriber.[[;]] In the former case, RNM maps the subscriber's number in roaming region to its number in home country, and then inquires HLR for the calling route. HLR ~~the HLR in the home country inquires for the subscriber corresponding to the called number in the RNM in the home country (here the called number is a complete phone number comprising country code and local phone number) to~~ finds the corresponding subscriber record and obtains subscriber location information (i.e., ~~the address of the~~ VLR number in the current roaming country), and thus obtains the route information through accessing the VLR in the roaming country, and then instructs the MSC ~~in the roaming country~~ to establish the call. In the RNM in home country, if any of the numbers maps to a subscriber, the mapping is unique; however, a subscriber may have been mapped to several numbers in different countries; no matter

which number is dialed by the caller, a unique subscriber record can be found, and thus the subscriber location information is obtained. In Fig.2, when the subscriber roams into country A, the calling subscriber who calls the roaming subscriber may dial number N or N1.

Please amend the first complete paragraph on page 32 of the original English-language translation of the specification (see lines 17-27) as indicated below:

In implementation of the embodiment shown in Fig.[[12]]11, only when the country after subscriber location change changes, the action of allocating a mobile phone number in the roaming country will be triggered. As long as the subscriber stays in the country, above number will be used, until the subscriber leaves the country. After above phone number allocation process is finished, the network will inform the roaming subscriber of the temporary local number in the current roaming country by means of short message, voice or Unstructured Supplementary Service Data (USSD) or other ways, depending on the capability of the network and the operator's choice.

Please amend the first complete paragraph on page 34 of the original English-language translation of the specification (see lines 3-11) as indicated below:

When the caller dials a bound number of the called subscriber, the HLR in the home country determinesRNM finds the subscriber corresponding to that number through inquiring in the RNM, and

inquires HLR to ~~find the subscriber record, and~~ obtain the subscriber location information (~~the address of~~ VLR number or MSC number), to accomplish route inquiry. Therefore, if the called subscriber has bound numbers, the caller will have more choices: the called subscriber's number in the home country, bound numbers, or the temporary number in the current contracted roaming country.

Please amend the second complete paragraph on page 34 of the original English-language translation of the specification (see lines 12-17) as indicated below:

Taking two roaming countries as an example, the embodiment in Fig.[[12]] 11 is described; actually, localized roaming service can be provided in a plurality of roaming countries, and the number of roaming countries is only limited by the number of contracted countries contracted by operators as well as storage capacity of and processing ability of the RNMs.